

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET, SUITE 1100 (CMP)
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES.

NPDES PERMIT NO.: MA0100552

NAME AND ADDRESS OF APPLICANT:

Lynn Water & Sewer Commission
400 Parkland Avenue
Attn: Daniel F. O'Neill, Executive Director
Lynn, Massachusetts 01905

The municipalities of Saugus, Swampscott, and Nahant are co-permittees for specific activities required by the permit. See Section VIII of this fact sheet and Sections I.B, and I.C. of the draft permit. The responsible municipal departments are:

Town of Nahant Selectmen 334 Nahant Road Nahant, MA 01908	Town of Swampscott Selectmen Elihu Thomson Adm. Building Swampscott, MA 01907	Town of Saugus Board of Public Works 298 Central Street Saugus, MA 01906
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NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Lynn Regional Wastewater Treatment Facility
2 Circle Avenue.
Lynn, MA 01905

Combined Sewer Overflow locations shown on Attachment A

RECEIVING WATERS: Lynn Harbor/Broad Sound, Nahant Bay, Saugus River and Strawberry Brook, in the North Coastal Watershed.

CLASSIFICATION: SA/SB, as designated by the Massachusetts State Water Quality Standards, 314 CMR 4.00

I. Proposed Action, Type of Facility, and Discharge Location.

The above named applicant has requested that the U.S. Environmental Protection Agency (EPA) reissue its NPDES permit to discharge into the designated receiving waters. The facility is engaged in collection and treatment of municipal and industrial wastewater. The discharges are from the Lynn Regional Wastewater Treatment Plant and from the combined sewer overflows listed in Attachment B of the draft NPDES permit. The locations of the wastewater treatment plant outfalls and CSO outfalls are provided in Attachment A of this fact sheet.

II. Description of Discharge

The Lynn Regional Wastewater Treatment Facility is a secondary wastewater treatment facility with a long term average design flow of 25.8 million gallons per day (mgd). The facility treats municipal wastewater from the City of Lynn and the Towns of Nahant, Swampscott and Saugus. The approximate population served in each municipality is listed below:

Lynn - 89,100
Saugus - 26,100
Swampscott - 14,400
Nahant - 3,600

About 11 percent of the service area is served by combined sewers. There are four combined sewer overflows from the Lynn collection system, which activate during heavy rains.

The wastewater treatment facility's unit processes include screening, grit removal, primary clarification, activated sludge aeration, secondary clarification, and chlorination. Flows up to 75 mgd are pumped out through the long outfall. During dry weather and low tide the pump station can be bypassed and the flow discharged through the long outfall by gravity. The treatment facility was designed with a peak secondary treatment capacity of 75 mgd, but a recent study has established that the hydraulic capacity of the secondary treatment system is limited to approximately 62 mgd. The bypass of secondary treatment is manually operated (in increments) when the instantaneous flow is greater than 65 mgd and/or when the secondary clarifier weirs become submerged, or there are sludge blanket problems. The draft permit imposes secondary treatment limits on the bypassed flows. The bypassed flows potentially could be regulated differently if the City of Lynn demonstrates that there are no feasible alternatives to bypassing excess flows.

Sludge processing facilities include gravity thickeners, centrifuges, and a fluidized bed incinerator. Sludge ash is buried at an adjacent landfill.

The treatment plant has two outfalls. Outfall 001 is approximately 14,000 feet long and discharges into Lynn Harbor, which is classified as SB/Restricted Shellfishing.

Outfall 002 discharges to Lynn Harbor just beyond the seawall at the shore and is only used during high flow events, when flows exceed 60 mgd. The exact flow at which outfall 002 is opened is primarily dependent on the tide cycle; at high tide the capacity of outfall 001 is approximately 60 mgd, but at low tide the flow capacity of outfall 001 is approximately 75 mgd. Since the peak secondary capacity has been established at 62 mgd (see discussion above), and outfall 002 will activate at peak flows between 60 and 75 mgd, the discharge through outfall 002 will, under almost all circumstances contain blended primary and secondary effluent. According to the discharge monitoring reports (DMRs) from October 2002 to November 2004, discharges through outfall 002 occurred 5 times as stated below:

Date	Total daily flow (in mg)
12/31/02	5.83
4/30/04	40.5
9/30/04	2.9
10/31/04	3.2
11/31/04	2.2

The receiving water is classified SB/Restricted Shellfishing.

Effluent data for the wastewater treatment plant discharge is shown on Attachment B of this fact sheet. The discharges from the CSOs are characteristic of raw sewage mixed with storm water.

III. Limitations and Conditions

The effluent limitations of the draft permit and the monitoring requirements may be found in the draft NPDES permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

Section 301 (b)(1)(B) of the Clean Water Act (CWA) requires publicly owned treatment works (POTWs) to achieve effluent limitations based on secondary treatment. Secondary treatment regulations are found at 40 CFR Part 133.102, and include effluent limitations on biochemical oxygen demand (BOD), total suspended solids (TSS), and pH.

Under Section 301(b)(1)(C) of the Clean Water Act (CWA), discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include, among other things, the requirements for the regulation and control of toxic constituents and also require that EPA criteria established pursuant to Section 304(a) of the CWA shall be used unless site specific criteria are established. The State will limit or prohibit discharges of pollutants to surface waters to assure that surface water quality standards of the receiving waters are protected and maintained or attained.

Regulations found at 40 CFR Part 122.44(d) require that NPDES permits include effluent limitations for any pollutant (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. An excursion occurs if the projected or actual instream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirement of the CWA. EPA's anti-backsliding provisions, found in Sections 402(o) and 303(d) of the CWA and in 40 CFR 122.44(l) restrict the relaxation of permits, standards, and conditions. Therefore, limits in a reissued permit must be at least as stringent as those of the previous permit unless specific criteria are met. Effluent limits based on BPJ, water quality, and state certification requirements must all meet the anti-backsliding provisions.

1. Outfall 001 :

- Dilution Factor

A dilution factor of 19 was used in the current permit for outfall 001. Outfall 001 is located in the outer harbor 14,000 feet offshore at a depth of 30 feet with an upturned elbow making a 30 degree angle to the horizontal. On April 12, 1999, LWSC provided a mixing zone calculation using two EPA-approved models "UPLUME" and "UOUTPLM". EPA and MassDEP have reviewed this calculation and agreed with a dilution factor of 19. This dilution factor was used to calculate water quality based limits in the draft permit.

- Conventional Pollutants

BOD and TSS

The average monthly and average weekly TSS and BOD limitations of 30 mg/l and 45 mg/l are based upon the secondary treatment regulation found at 40 CFR 133.102 and are the same as the limits in the existing permit. Mass limits for BOD and TSS have also been included in the permit.

The mass limits were calculated using the concentration effluent limitations, the design flow of 28.5 mgd, and a conversion factor of 8.34.

pH

The current permit limits the pH of the discharge to a range of 6.2 to 8.5 s.u. During the reissuance of the permit in 1994, the permittee requested and received a relaxation of the lower limit in the range from 6.5 to 6.2. The permittee's requested the lower limit based on depressed pH levels caused by nitrification, which consumes alkalinity. EPA and MassDEP granted the

relaxation because a discharge of effluent with a pH of 6.2 was not expected to cause a violation of water quality standards, given the tremendous buffering capacity of the Harbor. The draft permit retains the limits from the current permit.

Other Conventional Pollutants

The numerical limitations for fecal coliform and oil and grease are based on state certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53 and 124.55. These limitations are also in accordance with the Massachusetts Surface Water Quality Standards.

In addition, EPA has established a monthly monitoring requirement for Enterococci to gather information for determining whether the discharge has the reasonable potential to cause or contribute to exceedances of recently promulgated federal water quality criteria established to protect primary contact recreational uses (see 40 CFR part 131 dated November 16, 2004). No limit is established at this time. EPA will review the results, and if necessary, reopen the permit and impose a limit.

- Non Conventional Pollutants

Total Residual Chlorine

Chlorine and chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. The receiving water may or may not provide sufficient dilution of these compounds discharged by the wastewater treatment plant to meet the EPA recommended instream criteria for acute and chronic toxicity levels. National Recommended Water Quality Criteria : 2002 recommends that the four-day average concentration of total residual chlorine (TRC) in the receiving water should not exceed 7.5 ug/l more than once every three years on the average and the one-hour average concentration should not exceed 13 ug/l more than once every three years on the average.

Effluent limits calculated for outfall 001 using the water quality criteria and a dilution factor of 19 are as follows:

$$\text{Monthly Average Limit} = 7.5 \text{ ug/l} * 19 = 143 \text{ ug/l}$$

$$\text{Maximum Daily Limit} = 13 \text{ ug/l} * 19 = 247 \text{ ug/l}$$

These are essentially the same limits contained in the current permit (the monthly average limit in the current permit is 140 ug/l). A monthly average limit of 143 ug/l and a maximum daily limit of 247 ug/l will be included in the draft permit.

There are three chlorine contact tanks that are dosed independently. Contact tanks A and B are used for flows up to 60 mgd. At flows above 60 mgd, contact tank C is also used. All flows to outfall 001 must be monitored for chlorine residual and bacteria each day. If the facility is unable

to monitor all flows to outfall 001 at a single point, the draft permit requires that each contact tank contributing flow to outfall 001 be monitored separately on a daily basis and the flow weighted average reported on the DMRs.

Metals

Certain metals like copper, lead, nickel, cadmium and zinc can be toxic to aquatic life. Copper limits are included in the current permit and are carried forward in the draft permit. EPA evaluated the reasonable potential for the discharge of lead, nickel, zinc and cadmium to cause or contribute to exceedances of water quality standards.

Copper :

A maximum daily limit of 91.2 ug/l (as dissolved metal) was established in the current permit. Monthly average and maximum daily limits were calculated using current EPA-recommended criteria and a dilution factor of 19 to ensure that the limits are protective of water quality.

Allowable Discharge (total recoverable metal, ug/l) = $\frac{\text{Criteria (ug/l)}}{\text{CF}} \times \text{Dilution Factor}$

Criteria = Salt water criteria from National Recommended Water Quality Criteria : 2002 in dissolved metal

CF = conversion factor for converting from dissolved to total recoverable metal

$$\text{Monthly Average Limit} = \frac{3.1 \text{ ug/l}}{0.83} * 19 = 71 \text{ ug/l}$$

$$\text{Daily Maximum Limit} = \frac{4.8 \text{ ug/l}}{0.83} * 19 = 110 \text{ ug/l (equivalent to 91.2 ug/l as dissolved)}$$

The calculated limits have been included in the draft permit. Effluent data submitted by the permittee shows a monthly average effluent concentration range of 5.1 - 10 ug/l.

Lead, Nickel, Zinc and Cadmium

Allowable Receiving Water Concentration, $C = \text{Criteria (Tot. Rec.)} \times \text{Dilution Factor}$

Salt water criteria from National Recommended Water Quality Criteria: 2002 is used with a dilution factor of 19.

All effluent metals data are taken from the toxicity test reports from the period October 2002 to June 2004.

Lead : Chronic $C = 8.1 \times 19 / .951 = 162 \text{ ug/l}$ which is greater than the monthly average effluent concentration of 5 ug/l. So, reasonable potential does not exist.

	Acute	$C = 210 \times 19/.951 = 4196 \text{ ug/l}$ which is greater than the maximum effluent concentration of 5 ug/l. So, reasonable potential does not exist.
Zinc :	Chronic	$C = 81 \times 19/.946 = 1627 \text{ ug/l}$ which is far greater than the monthly average effluent concentration range of 23- 55 ug/l. So, reasonable potential does not exist.
	Acute	$C = 90 \times 19/.946 = 1808 \text{ ug/l}$ which is far greater than the maximum effluent concentration of 55 ug/l. So, reasonable potential does not exist.
Cadmium :	Chronic	$C = 9.3 \times 19/.994 = 178 \text{ ug/l}$ which is greater than the monthly average effluent concentration of 1 ug/l. So, reasonable potential does not exist.
	Acute	$C = 42 \times 19/.994 = 803 \text{ ug/l}$ which is far greater than the maximum effluent concentration of 1 ug/l. So, reasonable potential does not exist.
Nickel :	Chronic	$C = 8.2 \times 19/.99 = 157$ which is greater than the monthly average concentration range of 4 - 5.4 ug/l. So, reasonable potential does not exist.
	Acute	$C = 74 \times 19/.99 = 1520$ which is greater than the maximum effluent concentration of 5.4 ug/l. So, reasonable potential does not exist.

Based on this evaluation EPA has determined that there is no reasonable potential for adverse impact on the aquatic life for lead, zinc, nickel and cadmium and no need to monitor and limit them.

Whole Effluent Toxicity (WET)

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts State Surface Water Quality Standards include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

"All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife."

National studies conducted by the Environmental Protection Agency have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals,

chlorinated solvents and aromatic hydrocarbons among others. The Region's current policy is to include toxicity testing requirements in all municipal permits, while Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Based on the potential for toxicity resulting from domestic and industrial contributions, and in accordance with EPA regulation and policy, the draft permit includes acute toxicity limitations and monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784 (July 24, 1985); see also, EPA's Technical Support Document for Water Quality-Based Toxics Control and MassDEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters. EPA Region I and MassDEP have developed toxicity control policies. These policies require wastewater treatment facilities to perform toxicity bioassays on their effluents. The Commonwealth of MassDEP requires bioassay toxicity testing for state certification.

The MassDEP, in its "Implementation Policy for the Control of Toxic Pollutants in Surface Waters" (February 23, 1990) sets forth toxicity limits which have been adopted by EPA Region I. This document assigns effluent toxicity limits according to dilution factors based on perceived risk. The MassDEP prefers the use of acute toxicity tests in permits which may be measured with an LC50, or the concentration that is lethal to 50% of the test organisms. This value may also be expressed as a toxic unit (TU) which is defined as 100 divided by the LC50. Thus, an LC50 of 100% would equal 1.0 TU. The MassDEP prefers to use acute toxicity limits, based on dilution available to the effluent, and its recommended criterion to prevent acutely toxic effects is 0.3 TU. This value is based on an adjustment factor of one-third used to extrapolate the LC50 to an LC1, the concentration at which 1% of the test organisms die. In order to assure that the limit is met within a short distance of the effluent pipe, the MassDEP has recommended an end of pipe limit of 1.0 TU (LC50 = 100%) for dilution factors 100 or below and 2.0 TU (LC50 = 50%) for dilution factors above 100. Therefore, an LC50 limit of 100% has been maintained in this permit.

Pursuant to MassDEP and EPA Region 1 policy, chronic toxicity testing is required four times per year, and the limit is established at the instream waste concentration (IWC) of the wastewater treatment plant effluent. The IWC is the inverse of the dilution factor, so the No Observed Chronic Effect Concentration (C-NOEC) limit is established at 5.26 percent ($1 \div 19$). The limitation of 5.26% or greater in the draft permit prohibits chronic adverse effects (e.g., on survival, growth, and reproduction), when aquatic organisms are exposed to the POTW discharges at the calculated available dilution.

A review of the toxicity test reports from October 2002 to June 2004 reveals that the permittee is complying with chronic and acute tests for all species with the exception of *Menidia beryllina* for LC-50. The draft permit has reduced the requirement of testing from three to two species. The permittee will be required to test Inland silverside (*Menidia beryllina*) and Sea urchin (*Arbacia punctulata*), four times per year as stated in the draft permit.

2. *Outfall 002 :*

Outfall 002 is 60 inches in diameter and extends just beyond the seawall at the shore. The pipe is only partially submerged at mean low tide and is exposed at extreme low tides. As described earlier, flows exceeding the capacity of outfall 001 (which varies depending on the tide cycle) are discharged through outfall 002.

The current permit authorizes the discharge from outfall 002, subject to effluent limitations as follows:

BOD and TSS - 50 mg/l maximum daily

pH - 6.2 - 8.5 s.u.

fecal coliform - report average monthly and maximum daily

oil and grease - 15 mg/l maximum daily based on state regulations and certifications

TRC - monthly average of 7.5 ug/l and maximum daily of 13 ug/l based on zero dilution.

During the development of this permit, EPA and MassDEP reconsidered the need for this discharge to contain effluent limits based on secondary treatment, and determined that it was appropriate that the technology-based limits found at 40 CFR Part 133 be used as the basis for the effluent limits unless more stringent water quality-based limits were necessary. The limits in the draft permit are as follows:

BOD and TSS - monthly average of 30 mg/l and weekly average of 45 mg/l based on secondary treatment limits found at 40 CFR Part 133.

pH - range of 6.2 - 8.5 s.u. based on state water quality standards (see discussion on page 4)

fecal coliform - monthly average limit of 88 cfu/100 ml (calculated as a geometric mean) and daily maximum limit of 260 cfu/100 ml based on state water quality criteria.

oil and grease - daily maximum limit of 15 mg/l based on state regulations and certifications

TRC - monthly average and maximum daily limits of 7.5 and 13 ug/l respectively, based on salt water criteria from National Recommended Water Quality Criteria: 2002 and zero dilution.

Copper - maximum daily limit of 4.8 ug/l (dissolved) based on acute salt water criteria from National Recommended Water Quality Criteria: 2002 and zero dilution. Total maximum daily limit will be $4.8 / 0.83 = 5.8$ ug/l.

EPA and MassDEP recognize that until the CSO abatement plan is fully implemented, the use of outfall 002 will be part of a high flow management plan which will mitigate the frequency and magnitude of CSO discharges.

V. Combined Sewer Overflows: Conditions for Discharge

1. General: Combined Sewer Overflows (CSOs) are overflows from a combined sewer system that are discharged into a receiving water without going to the headworks of a publicly owned treatment works (POTWs). CSOs occur when the flow in the combined sewer system exceeds interceptor or regulator capacity. CSOs are distinguished from bypasses which are "intentional diversions of waste streams from any portion of a treatment facility" (40 CFR §122.41(m)).

Flows in combined sewers can be classified into two categories: wet weather flow and dry weather flow. Wet weather flow is a combination of domestic and industrial sewage, infiltration from groundwater, and storm water flow including snow melt. Dry weather flow is the flow in a combined sewer that results from domestic sewage, groundwater infiltration and industrial wastes with no contribution from storm water runoff or storm water induced infiltration.

Dry weather overflows from CSOs are illegal. They must be reported immediately to EPA and eliminated as expeditiously as possible.

The objectives of the National CSO Control Policy are:

- 1) To ensure that if the CSO discharges occur, they are only as a result of wet weather,
- 2) To bring all wet weather CSO discharge points into compliance with the technology based requirements of the CWA and applicable Federal and State water quality standards, and
- 3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

2. Effluent Standards: CSOs are point sources subject to NPDES permit requirements for both water quality based and technology-based requirements but are not subject to secondary treatment regulations applicable to publicly owned treatment works.

Section 301(b)(1)(C) of the Clean Water Act (CWA) of 1977 mandated compliance with Federal and State Water Quality Standards by July 1, 1977. Technology based permit limits must be established for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Water Quality Act Amendments of 1987 (WQA).

3. Conditions for Discharge: The draft permit prohibits dry weather discharges from CSO outfalls. During wet weather, the discharges must not cause violation of Federal and State Water Quality Standards. Dry weather discharges must be reported immediately to EPA and the State. Wet weather discharges must be monitored and reported as specified in the permit.

4. *Nine Minimum Controls (NMC)*: The permittee must comply with BPJ derived BCT/BAT controls, which at a minimum include the following: (1) proper operation and maintenance of the sewer system and outfalls; (2) maximum use of the collection systems for storage; (3) review pretreatment programs to assure CSO impacts are minimized; (4) maximization of flow to the POTW for treatment; (5) prohibition of dry weather overflows; (6) control of solid and floatable materials in the discharge; (7) pollution prevention programs which focus on contaminant reduction activities; (8) public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

5. *Documentation*: The permittee is required to submit an updated report on its NMC program within one year of the effective date of the permit to EPA and MassDEP. Documentation of the NMC program must demonstrate implementation of the nine minimum controls, including any suggested schedules for completing minor construction activities. This documentation must include a detailed analysis of specific activities the permittee has undertaken and will undertake to implement the nine minimum controls and additional controls beyond the nine minimum controls the permittee can feasibly implement. The specific activities included in the documentation must include the minimum requirements set forth in Part I.F.2 of this permit and additional activities the permittee can reasonably undertake. When approved, this documentation will constitute the specific activities and levels of control required under this permit. Documentation may include operation and maintenance plans, revised sewer use ordinances for industrial users, sewer system inspection reports, infiltration/inflow studies, pollution prevention programs, public notification plans and facility plans for maximizing the capacities of the existing collection and treatment system, as well as contracts and schedules for minor construction programs for improving the existing systems operation. The documentation shall also include information which indicates the degree to which the controls achieve compliance with water quality standards.

6. *Reopener/Additional CSO Control Measures*: The permit requires an annual certification, no later than January 15th of each year, that states that all discharges from combined sewer outfalls were recorded, and other appropriate records and reports maintained for the previous calendar year.

This permit may be modified or reissued upon the completion of a long-term CSO control plan. Such modification may include performance standards for the selected controls, a post construction water quality assessment program, monitoring for compliance with water quality standards, and a reopener clause to be used in the event that the selected CSO controls fail to meet water quality standards. Section 301(b)(1)(C) requires that a permit include limits that may be necessary to protect Federal and State water quality standards.

The LWSC was also required to submit a CSO facilities plan to EPA and the Massachusetts Division of Water Pollution Control by May 22, 1979, according to the consent decree and court order entered in the CWA enforcement case brought by the EPA against the City of Lynn, United States v. City of Lynn, Massachusetts, et al. (D.Mass., C.A.N. 76-2184-G). The CSO facilities plan was submitted to EPA and the Massachusetts Division of Water Pollution Control in

February 1984. The CSO facilities plan was reviewed and determined to be inadequate by the MADWPC. The CSO facilities plan was resubmitted after necessary corrections and was approved by MassDEP on October 11, 1991. The plan called for partial separation in West Lynn to eliminate a CSO to the Saugus River, and partial separation and storage to reduce CSO discharges to Kings Beach and Lynn Harbor. The West Lynn work was completed during the 1990s. Due to affordability concerns work on the East Lynn CSOs was postponed.

In 2000, Lynn proposed to eliminate the East Lynn CSOs (004, 005, and 006) through a series of design/build separation projects. In 2001 the Consent Decree was modified to incorporate a schedule to complete these separation projects and eliminate these CSOs by the end of 2009. Lynn has since completed two separation projects in the CSO 006 tributary area. In late 2003 Lynn discovered that a more extensive and expensive separation and private inflow removal program than anticipated would be required to eliminate all CSO discharges. In late 2004 Lynn submitted a Draft CSO Supplemental Facilities Plan to evaluate solutions to this problem. The Draft CSO Supplemental Facilities Plan outlines a plan to minimize CSO events at the planning level cost of \$55M over 15 years. This report is still under review by EPA and Mass DEP.

VI. Other Monitoring Requirements

The effluent monitoring requirements have been specified in accordance with 40 CFR 122.41(j), 122.44(i) and 122.48 to yield data representative of the discharge.

VII. Sludge

Section 405(d) of the Act requires that EPA develop technical regulations regarding the use and disposal of sewage sludge. These regulations are found at 40 CFR part 503 and apply to any facility engaged in the treatment of domestic sewage. The Act further requires that these conditions be implemented through permits. The sludge conditions in the draft permit are intended to implement these regulations.

The Lynn Water and Sewer Commission owns a fluidized bed incinerator that is operated by Veolia Water North America. The incinerator has scrubbers and a downflow wet electrostatic precipitator for air pollution control devices. The City generates approximately 4635 dry metric tons annually of sewage sludge.

Subpart E of the part 503 regulations outlines the standards for the incineration of sewage sludge. The permit contains general requirements, management practices, pollutant limitations, an operational standard, monitoring frequency, record keeping and reporting requirements implementing the provisions of the regulations. The basis of each provision is detailed below.

Pollutant Limitations

The sludge standards regulate seven metals. The pollutant limits in the permit are based on the requirements in §503.43.

Mercury and beryllium are regulated by the National Emission Standard for Hazardous Air Pollutants (NESHAPs) found in 40 CFR part 61. The permit requires that the firing of sewage sludge in the facility's incinerators do not cause the violation of the NESHAPs for mercury and beryllium. The NESHAP for beryllium applies to each incinerator. The NESHAP for mercury applies to the facility.

The allowable sludge concentrations for arsenic, cadmium, chromium, and nickel are calculated from Equation (5) in §503.43(d):

$$C = \frac{RSC \times 86,400}{DF \times (1 - CE) \times SF} \quad \text{Eq. (5)}$$

Where:

- C = Daily concentration of pollutant in sewage sludge in mg/kg of total solids (dry weight basis)
- CE = control efficiency for the incinerator - based on performance tests
- DF = dispersion factor in micrograms per cubic meter per gram per second
- RSC = risk specific concentration in micrograms per cubic meter
- SF = sewage sludge feed rate in metric tons per day (dry weight basis)

The parameters, with the exception of RSC, are site specific to the Lynn's incinerator. The RSC is derived for each pollutant based on a risk assessment.

The RSC is the allowable increase in the average daily ground level ambient air concentration for a pollutant above background levels that result from the firing of sewage sludge in an incinerator. It is equivalent to the amount of a pollutant that a person living near the incinerator can inhale with a probability of 1 in 10,000 that the person will contact cancer as a result of inhaling the pollutant. The RSC was calculated from the equation below:

$$RSC = \frac{RL \times BW}{Q^* \times I_a} \times 10^3$$

Where:

- RL = Risk Level, 10^{-4}
- BW = body weight, 70 kg (154 lbs), this is the average weight of an adult male
- Q^* = allowable dose of a pollutant from EPA's Integrated Risk Information System data base
- I = inhalation rate, 20 m/day, normal inhalation rate for an adult male.

The RSC calculated from this equation is intended to protect the "Highly Exposed Individual" (HEI). The HEI is a person who remains for an extended period of time, 70 years, at the point of maximum ground level pollutant concentration. The RSC values for the regulated metals are found in Tables 1 and 2 of § 503.43.

The pollutant limit for lead is calculated using equation (4) of §503.43:

$$C = \frac{0.1 \times \text{NAAQS} \times 86,400}{\text{DF} \times (1 - \text{CE}) \times \text{SF}} \quad \text{Eq. (4)}$$

Instead of using an RSC, a percentage of the National Ambient Air Quality Standard (NAAQS) for lead was used. The NAAQS for lead is found in 40 CFR part 50.12. It is $1.5 \mu\text{g}/\text{m}^3$. Although lead is classified as a probable human carcinogen, the Clean Air Science Advisory Committee of the Science Advisory Board recommended that the NAAQS for lead be based on the noncarcinogenic effects. Developmental neurotoxicity is considered to be the most sensitive end point for lead exposure. The calculated concentration from equation (4) also protects the HEI described above.

The following are parameters used to calculate metals limits contained in the permit:

Sludge Feed Rate: 22.49 metric tons/day

Dispersion factor: $5.99 \mu\text{g}/\text{m}^3/\text{g}/\text{sec}$

<u>Pollutant</u>	<u>Control Efficiency</u>	<u>RSC</u>
Arsenic	99.93	0.023
Cadmium	99.98	0.057
Chromium	99.99	0.23
Lead	99.99	
Nickel	99.96	2.0

Operational Standard

The part 503 regulations have an operational standard for total hydrocarbons. Hydrocarbons are simple organic compounds containing carbon and hydrogen. The standard is designed to regulate organic emissions from sewage sludge incinerators. Total hydrocarbons represent a subset of organic compounds and is used in the regulation since it is impractical to attempt to monitor sludges or stack emissions for all organic compounds which may be present.

The THC value must be corrected to seven percent oxygen and zero percent moisture. The correction to seven percent oxygen is used because seven percent is the standard amount of oxygen used to reference measurements of pollutant limits expressed as concentration; it is also equivalent to 50 percent excess air (excess air is air added to a system above the amount of air needed for complete combustion to occur); and without the correction, inaccurate readings may occur because the presence of the additional oxygen may dilute the THC reading. Similarly, the correction for moisture is needed since the presence of moisture can also dilute the actual THC reading. THC is conventionally expressed in terms of a dry volumetric basis, hence the need to set the standard based on zero moisture.

On February 25, 1994, §503.40 was amended. The amendment allows facilities to monitor carbon monoxide (CO) instead of THC. This is allowed if the facility can meet a monthly

average concentration CO limit of 100 parts per million on a volumetric basis. This limit is also corrected to seven percent oxygen and zero percent moisture. The City of Lynn monitors CO.

Management Practices

The permit contains management practices based on §503.45. They pertain to the operation of the incinerator. The management practices include maintaining the instruments which monitor CO, oxygen and temperature; proper operation of all air pollution control devices; and notification to EPA when the continuous monitoring equipment is not operational for a period of 72 hours or more.

The permit requires notification of EPA and the state if any monitoring equipment is broken or shut down for longer than 72 hours. It also prohibits adversely affecting a threatened or endangered species or their critical habitat. There are no known threatened or endangered species within the vicinity of the incinerator. Therefore, EPA has determined that the activity will not affect a threatened or endangered species.

The monitoring frequency is based on §503.46. The City is required to monitor heavy metals 6 times per year. The monitoring for mercury and beryllium is at the frequency required by 40 CFR part 61. The record keeping requirements are based on §503.47.

VIII. Infiltration/Inflow

Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow reducing the capacity and the efficiency of the treatment works and may cause bypasses of secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

The draft permit includes requirements for the permittee and co-permittees to control infiltration and inflow (I/I) into the separate sewer collection systems they own and operate. The co-permittees shall each develop an I/I removal program commensurate with the severity of the I/I in the collection system. In sections of the collection system that have minimal I/I, the control program will logically be scaled down.

The permit standard conditions for 'Proper Operation and Maintenance' are found at 40 CFR §122.41(e). These require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, the co-permittees have a 'duty to mitigate' as stated in 40 CFR §122.41 (d). This requires the co-permittees to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment. EPA and MassDEP maintain that an I/I removal program is an integral component to insuring permit compliance under both of these provisions.

The MassDEP has stated that inclusion of the I/I conditions in the draft permit shall be a standard State Certification requirement under Section 401 of the Clean Water Act and 40 CFR §124.55(b).

IX. Pretreatment Program

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR §403 and section 307 of the ACT. The City of Lynn's (Lynn's) pretreatment program received EPA approval on July 19, 1989, and as a result, appropriate pretreatment program requirements were incorporated into the previous permit commensurate with that approval and Federal Pretreatment Regulations in effect when the permit was issued.

In October 1988 and July 1990, the Federal Pretreatment Regulations at 40 CFR §403 were amended. Those amendments established new requirements for implementation of pretreatment programs. By reissuing this NPDES permit, the permittee is obligated to modify, if necessary, and implement its pretreatment program to be consistent with current Federal Regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce specific effluent limits (technically-based local limits); (2) revise its local sewer-use ordinance, as appropriate, to be consistent with Federal Regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of significant industrial user. These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

In addition to the requirements described above, the draft permit requires the permittee to provide EPA in writing within 120 days of the effective date of the permit a technical report analyzing the adequacy of existing local limits and the need for additional local limits. Lastly, the permittee must continue to submit, annually by March 1, a pretreatment report detailing the activities of the program for the twelve month period ending 60 days prior to the due date.

X. Essential Fish Habitat Determination (EFH)

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 *et seq.*(1998)), EPA is required to consult with NMFS if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat. 16 U.S.C. § 1855(b). The Amendments broadly define essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. § 1802(10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 50 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

A review of the relevant essential fish habitat information provided by NMFS indicates that the wastewater outfall exists within designated EFH for 24 federally managed species. (See attachment C).

The outfall 001 discharges into 30 feet of water, approximately 14,000 feet south of the plant in Broad Sound. This area is subjected to currents associated with a semi-diurnal tidal exchange. The substrate in this area is predominantly soft, as depicted on nautical charts, indicative of a depositional environment. The effluent, which is discharged through a 60 inch diameter single-port outfall with an up-turned elbow making a 30 degree angle to the horizontal, mixes with a high volume of receiving water, with a calculated dilution factor of 19 (dilution ratio of 18:1).

The limitations of all parameters in the current permit will continue in the draft. In addition, the permit also requires that the discharge shall not violate the state surface water quality standards.

Based on the information provided above, and with no documented evidence of environmental degradation from the current discharge, EPA has concluded that the proposed permit activity will have no adverse impact to EFH, and as such consultation with NMFS is not required. However, if adverse impacts to EFH are detected as a result of this permit action, NMFS will be notified and an EFH consultation will be promptly initiated.

XI. State Certification Requirements

The staff of the State Water Pollution Control Agency has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

XII. Public Comment Period, Public Hearing, and Procedures for Final Decision

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection, 1 Congress Street, Suite 1100 (CMP) Boston, MA 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XIII. EPA Contact

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Suproakash Sarker, P.E.
Environmental Protection Agency
MA NPDES Permit Unit
1 Congress Street, Suite 1100 (CMP)
Boston, MA 02114-2023
Telephone: (617) 918-1693

Date

Linda M. Murphy, Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA